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Terriera simplex, a new species of *Rhytismatales* from China

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Abstract —A new *Terriera* species found on fallen leaves of *Trachelospermum jasminoides* (*Apocynaceae*) is described, illustrated, and designated as *Terriera simplex*. This taxon is distinguished from its closest relatives by unbranched paraphyses and asci with truncate or subtruncate apices. The type specimen is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, China (AAUF).

Key words —taxonomy, *Ascomycota*, morphology, vine plant

Introduction

The genus *Terriera* B. Erikss. was established by Eriksson (1970) for *T. cladophila* (Lév.) B. Erikss., belonging to *Rhytismataceae* (Kirk et al. 2008). Minter (1996) provided a detailed description of the type species.

Over the years, however, some species which should belong to *Terriera* have been mistakenly placed in *Clithris* (Fr.) Bonord., *Dermascia* Tehon, *Hypoderma* De Not., and (particularly) *Lophodermium* Chevall. (Johnston 2001). Johnston (2001), who divided *Lophodermium* on monocotyledonous plants into groups A, B, C, and D, regarded Group B species as closer to the type species of *Terriera* based on their special ascomatal structure. He therefore transferred 11 species and 1 variety of *Lophodermium* Group B to *Terriera* as new combinations and published three new species. The author also invalidly published a fourth species, in that work, which he later validly published as *T. samuelsii* P.R. Johnst. (Johnston 2003). In the paper by Ortiz-García et al. (2003), Johnston recombined *Clithris minor* Tehon as *T. minor* (Tehon) P.R. Johnst. rDNA-ITS sequence analyses by Ortiz-García et al. (2003) indicated that *Lophodermium* from pine hosts were distally related to *Terriera* and that two monophyletic *Terriera* sequences formed a weakly supported sister group related to *Lirula macrospora* (R. Hartig) Darker.

Five *Terriera* species have previously been reported from China: *T. brevis* (Berk.) P.R. Johnst., *T. huangshanensis* Z.Z. Yang et al., *T. camelliae* (Teng) Y.R. Lin & Jiang L. Chen, *T. coacervata* Y.R. Lin & Q. Zheng, and *T. illiciicola* (S.J. Wang et al.) Q. Zheng & Y.R. Lin (Fröhlich & Hyde 2000, Yang et al. 2011, Chen et al. 2012, Zheng et al. 2012). In the present paper, we describe a new species of *Terriera* on confederate jasmine, a vine from the Dabie Mountains in Anhui Province, China.

Materials & methods

External characteristics of conidiomata and ascomata obtained from open ascomata of the holotype specimen were observed under a dissecting microscope at 10–50×. After rehydration in water for 10 min, 10–15 µm thick sections of the conidiomata and ascomata were cut using a freezing microtome. Microscopic examinations were made in water, 5% KOH, Melzer's reagent, or 0.1% (w/v) cotton blue in lactic acid. For observing the outlines of ascomata and conidiomata in vertical section, sections were mounted in lactic acid or cotton blue with pretreatment in water. Gelatinous sheaths surrounding ascospores and paraphyses were observed in water or cotton blue in lactic acid. The color of internal structures and ascospore contents were observed in water. Measurements and drawings of asci, ascospores, and paraphyses (30 per specimen) were made using material mounted in 5% KOH or Melzer's reagent. Point and line integrated illustrations of external shapes and internal structures of the conidiomata and ascomata were prepared using a microscope drawing device.

Taxonomy

Terriera simplex Y.R. Lin, X.M. Gao & C.T. Zheng, **sp. nov.** Figs 1–6

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Differs from *T. cladophila* in unbranched paraphyses and asci with truncate or subtruncate apices and from *T. minor* by the presence of conidiomata and ascomata with obtuse, rounded or slightly acute ends.

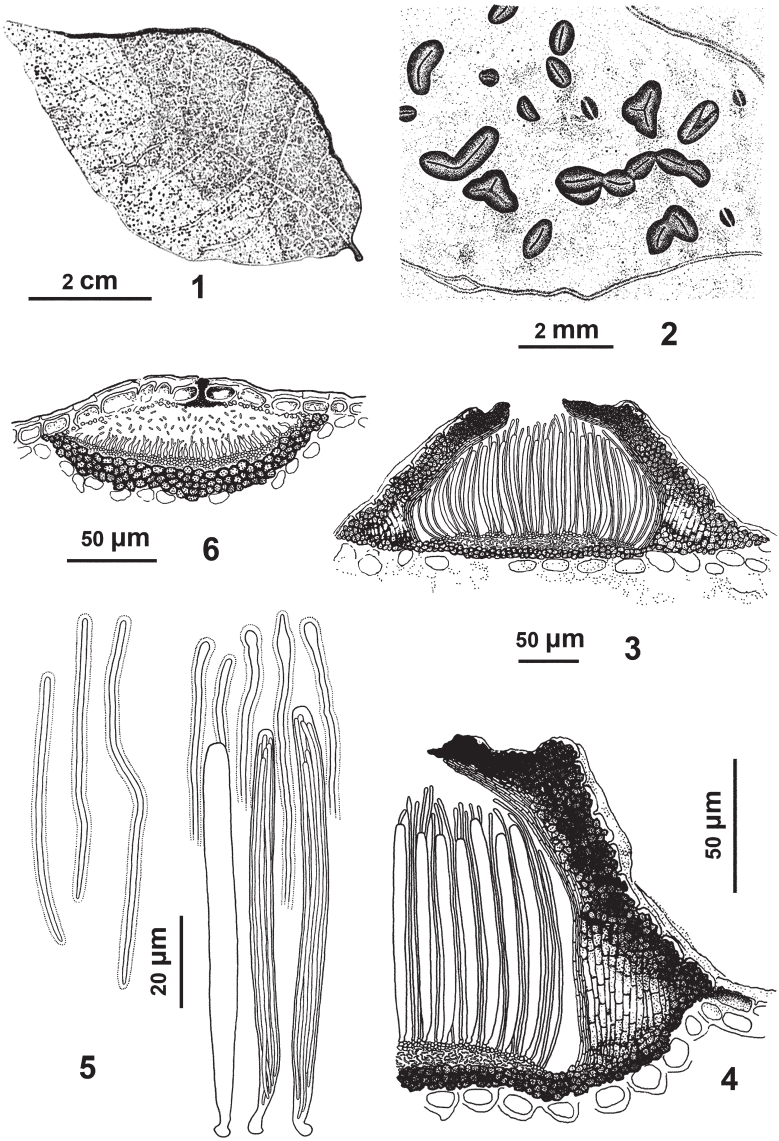
Type: on fallen leaves of *Trachelospermum jasminoides* (Lindl.) Lem. (*Apocynaceae*), China, Anhui, Dabie Mountains, Tiantangzhai, alt. ca 700 m, 16 September 2005, S.J. Wang and Y.R. Lin 2020 (**Holotype** AAUF 68128).

Etymology: *simplex,* referring to the simple paraphyses, which are not branched near the apex.

Zone lines absent.

Conidiomata on both sides of leaves, crowded or sometimes coalescent.

In surface view, conidiomata 130–200 µm diam., rounded or subrounded, black-brown in the centre, more or less concolorous with the substratum surface elsewhere, slightly raising the leaf surface, discharging spores through a 3–5 µm diam. apical ostiole. In vertical section, conidiomata subepidermal, lenticular. Upper wall very poorly developed, composed of tiny, thin-walled globose cells 1.6–2 µm diam. Basal wall well developed, 12–17 µm thick, consisting of 2–4 (–5) layers of angular cells 2–4.5 µm diam. Subconidiogenous layer 4.5–8



Figs 1–6. *Terriera simplex* on *Trachelospermum jasminoides*. 1. A leaf bearing fruit bodies. 2. Conidiomata and ascomata observed under a dissecting microscope. 3. Ascoma in median vertical section. 4. Portion of ascoma in median vertical section. 5. Paraphyses, asci and ascospores. 6. Conidioma in vertical section.

μm thick, composed of textura angularis with nearly colorless, thin-walled cells. Conidiogenous cells 6–11 × 2–3 μm, subcylindrical, tapering to the apex, proliferating sympodially. Conidia 2.5–4 × ca 1 μm, cylindrical or nearly elliptical, hyaline, unicellular.

Ascomata in similar positions to conidiomata on the substratum, crowded in irregular, light yellow to grayish-white, large bleached areas without obvious edges, sometimes 2–6 ascomata coalescent. In surface view, ascomata 650–1000 × 350–480 μm, elliptical to ovate, ends obtuse, rounded or slightly acute, black, slightly shiny, with a clearly marked outline, moderately raising the surface of the leaf, opening by a single longitudinal split which is sometimes branched in the triangular ascomata. Immature ascomata seen as two parallel black patches on the substratum surface rather than as a single more or less elliptical one, with a pale central zone along future line of opening. Lips absent; split extending 3/4–4/5 the length of the ascoma. In median vertical section, ascomata subepidermal, with epidermal cells becoming filled with fungal tissue as ascomata develop, 120–135 μm deep. Covering stroma 18–22 μm thick near the opening, black-brown, composed of textura angularis with thick-walled cells 3–5.5 μm diam. Along the edge of the ascoma opening, there is a flattened, 8–12 μm thick extension adjacent to the covering stroma, and which comprises strongly carbonized tissue with no obvious cellular structure. Excipulum very poorly developed, arising from the inner layer of the basal stroma, consisting of hyaline textura porrecta. Basal stroma 6–15 μm thick, dark-brown, composed of 2–3(–4) layers of 3–5 μm diam., angular, thick-walled cells. 20–32 μm thick textura prismatica with somewhat thin-walled, nearly colorless to grayish-brown cells exists between the covering stroma and basal stroma. Subhymenium moderately developed, 7–12 μm thick, consisting of hyaline textura angularis and intricata. Paraphyses 95–110 × 1.2–1.5 μm, filiform, aseptate, not branched, occasionally gradually or abruptly swollen to 2.5–3 μm near the apex where sometimes agglutinated, covered in a ca 1 μm thick gelatinous matrix. Asci ripening synchronously, 72–95(–105) × 4.8–5.2 μm, cylindrical, very short-stalked, thin-walled, apex truncate, subtruncate or obtuse, without circumapical thickening, J–, 8-spored. Ascospores arranged in a fascicle, (45–)56–82 × 1–1.2 μm, filiform, slightly tapered towards the rounded base, hyaline, with a gelatinous sheath 0.8–1 μm thick.

Host species & distribution: producing conidiomata and ascomata on fallen leaves of *Trachelospermum jasminoides*; known only from the type locality, Anhui, China.

Comments—We place our new species in *Terriera* based on the presence of a strongly carbonized extension adjacent to the ascoma opening and textura prismatica in the corner between the covering and basal stroma and the absence of lip cells.

Terriera simplex is distinguished from the type species *T. cladophila* by its sometimes coalescent and occasionally three-lobed ascomata, paraphyses with unbranched upper parts, and asci with truncate or subtruncate apices. While ascomata in *T. cladophila* are scattered and sometimes circular, the paraphyses are frequently and irregularly branched and irregularly twisted or swollen at the apex, and the tips of asci are rather rounded (Minter 1996). *Terriera minor*, a widely distributed species, resembles *T. simplex* but differs in ascomata with rounded ends that are not associated with conidiomata, paraphyses that branch 2–3 times in the upper 30–40 µm, and sequentially maturing asci (Johnston 1988, 1989a,b).

Ascomata of *T. simplex* are mature on dead leaves. It is not known whether this fungus occurs in living leaves as a mutualistic endobiont or as a parasite. This needs to be investigated.

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